# DEPARTMENT OF NATURAL RESOURCES

# Status of the Fisheries in Michigan Waters of Lake Erie and Lake St. Clair, 2021


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*Spotfin Shiner collected in Lake St. Clair, July 2021*

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Lake St. Clair Fisheries Research Station
Website: https://www.michigan.gov/dnr/managing-resources/fisheries/research/lk-st-clair


FISHERIES DIVISION

# Highlights for 2021

The purpose of this report is to provide an update on the status of the fisheries in the Great Lakes and connecting waters of Southeast Michigan. Sources of information used in compiling this report include creel surveys, charter boat reports, an angler diary program, the Michigan Department of Natural Resources (MDNR) Master Angler program, commercial fishery records, and fisheries survey results. Some of the highlights described in detail include:

- Recreational anglers spent an estimated 449,736 hours fishing Lake Erie in 2021, taking over 93,000 total trips and catching more than 860,000 fish.
- The Lake Erie Walleye fishery remained excellent in 2021, with high harvest rates and a strong contribution of large fish from the 2015 year class.
- The Yellow Perch fishery in Michigan's Lake Erie waters has improved since a low in 2019, but harvest rates in both the non-charter recreational boat fishery and the charter fishery remain below average.
- Forage fish abundance in Michigan's Lake Erie bottom trawl survey increased during 2021, which mirrored the results of the western basin trawl survey completed by Ontario and Ohio.
- Charter excursions on the St. Clair-Detroit River System were up 41% from 2019.
- Forty-one Smallmouth Bass were acoustically tagged in Lake St. Clair in 2021.
- In Lake St. Clair we observed the highest catch rate of Spottail Shiners in our spring survey since 2012 and highest catch rate of Emerald Shiners in spring surveys since 2009.
- We handled a total of 156 Lake Sturgeon from the St. Clair River and Lake St. Clair in 2021.
- In 2021 we observed the highest catch rate of juvenile Lake Sturgeon in the St. Clair River setline survey since it began in 1996.

## About the Lake St. Clair Fisheries Research Station

The Lake St. Clair Fisheries Research Station is a unit of the Research Section of the MDNR Fisheries Division. The station conducts research and stock assessment on fish populations of Lake Erie, the St. Clair-Detroit River System (the St. Clair River, Lake St. Clair and the Detroit River), and Saginaw Bay. Results of this work are instrumental in fisheries management decisions affecting these waters. The station works closely with fisheries managers in the MDNR's Lake Erie Management Unit and routinely collaborates in joint projects with other state and federal partner agencies, local units of government, non-government organizations, academic institutions, and stakeholder groups. Federal Aid in Sport Fish Restoration (SFR) Act dollars provide support for the majority of the station's assessment activities. The SFR Program provides grant funds to restore and better manage America's fishery resources through excise taxes on the purchase of fishing equipment, motorboat and small engine fuels, import duties, and interest. More information on the SFR Program can be found at: https://www.fws.gov/program/sport-fish-restoration.

## Methods Summary

The Lake St. Clair Fisheries Research Station collects data on the status of fisheries in Michigan waters of Lake Erie and Lake St. Clair through a variety of methods. Information on angler catch rates, effort, and opinion of Michigan's sport fisheries is collected with angler surveys. An angler survey can be conducted on-site where anglers are interviewed or counted while on the water, or off-site when anglers are interviewed by mail or telephone. On-site methods, also known as creel surveys, have been used extensively by the MDNR on various Michigan waters to estimate angler effort, harvest, and catch. In Southeast Michigan, on-site creel survey data are collected each year from the non-charter recreational fishery of Lake Erie. An on-site creel survey was also conducted on Lake St. Clair during 2021, however creel data from 2021 were not available at the publication date of this report for Lake St. Clair and are therefore excluded. Charter boat harvest, release, and angling effort are also recorded by Lake Erie and St. Clair-Detroit River System charter operators, who are required to report this information to the MDNR on a monthly basis for their activities in the American waters of these systems. In 2021 some charter captains began voluntarily reporting their catches in the Canadian

waters of the St. Clair-Detroit River system. However, to retain consistency with past years we only report data submitted from the American waters of the system in this document. Nevertheless, we thank captains providing their catch data regardless of what jurisdiction that they fished, as this provides a much more complete picture of the status of the fishery.

A voluntary Sport Fishery Diary Program is used to collect catch and effort data for recreational fishing on Lake St. Clair. The program was initiated by the Ontario Ministry of Natural Resources and Forestry (OMNRF) in 1985 to monitor trends in the Muskellunge catch rate for Lake St. Clair. Five years later the program was expanded to include other species. The MDNR became involved in the program in 1993. From 1993-2018, the program was a cooperative effort between the OMNRF and MDNR to provide annual estimates of catch rates for the major sport fish species in Lake St. Clair. Starting in 2019 the OMNRF ended their participation, and 2021 marked the final year of MDNR use of the program as well. The MDNR Master Angler program, established in 1973 to recognize anglers who catch unusually large fish, also provides information on trends in voluntary reports of "trophy" catches throughout the Great Lakes waters of Southeast Michigan.

The MDNR conducts several annual assessments using a variety of gear types to target the diverse fish communities present in Lake Erie and the St. Clair-Detroit River System. Since 1978, the Lake St. Clair Fisheries Research Station has fished variable mesh multi-filament gill nets at two fixed (index) locations in western Lake Erie each fall, as part of the interagency Walleye assessment program. Four new randomly-selected locations were added in 2021. We conduct a bottom trawl survey in Lake Erie each August to measure recruitment of important fish species and forage abundance. Trap nets have been deployed in Anchor Bay of Lake St. Clair each spring since 2002, with the exception of 2016 and 2020, to sample adult fish populations, while juvenile and forage fish populations in Lake St. Clair have been assessed with bottom trawls each spring and fall since 1996. In 2016 a nearshore electrofishing survey was added to better characterize fish communities in the nearshore areas of Lake St. Clair where larger vessels cannot operate. A setline survey has been used to monitor the Lake Sturgeon population in the North Channel of the St. Clair River each June since 1997; beginning in 2013 the MDNR modified its bottom trawl to increase its success in capturing Lake Sturgeon in Lake St. Clair.

# Lake Erie

### *Sport Fishery Summary*

Lake Erie's sport fishery is intense. While Lake Erie only accounted for 15% of the total non-charter, recreational boat angling effort spent on Michigan's Great Lakes waters during 2021, it accounted for over one-third of the total catch. Further, the angling intensity in Michigan waters of Lake Erie during 2021 was 3,664 hours of angler effort per square mile of water, which is over 50 times higher than the angling intensity of Michigan waters of lakes Huron, Michigan, and Superior combined. Anglers who fished Michigan's Lake Erie waters during 2021 were rewarded with high catch rates. On average, Lake Erie anglers caught 1.9 fish per hour of effort, which is three times higher than the catch rates in Michigan waters of lakes Huron, Michigan, and Superior combined.

The annual creel survey conducted by the MDNR during 2021 produced an effort estimate of 449,736 angler hours and a total catch estimate of 848,946 fish (Table 1) for Michigan's Lake Erie non-charter recreational boat fishery. Angling effort and catch could not be compared to the previous year because the COVID-19 pandemic prevented a complete April-October creel survey in 2020; both measures increased compared to 2019 (2019 effort: 334,026 hours, 2019 total catch: 479,726 fish). Angler effort and total harvest in 2021 was driven by the Walleye and Yellow Perch fisheries; targeted Walleye effort totaled 324,650 angler hours and targeted Yellow Perch effort 113,935 angler hours. Total harvest for both species (177,948 Walleye and 190,965 Yellow Perch, Figure 1) accounted for 96% of the 385,526 fish non-charter, recreational boat fishery total harvest in Michigan waters. Other fish species accounted for less than 5% of total harvest.

In 2021, Michigan charter boat operators reported a total harvest of 36,628 fish of all species from Michigan waters of Lake Erie during 1,169 excursions, up substantially from 2020 (24,183 fish during 704 excursions). Note however that restrictions during the pandemic resulted in the charter fishery not operating during April and the first part of May 2020. Similar to the non-charter recreational boat fishery, Walleye and Yellow Perch comprised the greatest proportion of the

total harvest in the charter fishery (64% and 35%, respectively). Other species harvested by charter anglers during 2021, including Smallmouth Bass and White Bass, accounted for less than 1% of the total.

*Yellow Perch*

Although Yellow Perch fishing in Michigan's Lake Erie waters has improved since 2019 when the targeted harvest rate (0.84 fish per hour) in the non-charter recreational boat fishery was the 2nd lowest in the 1986-2021 time series, the 2021 harvest rate (1.68 fish per hour, Figure 2) is still below the long-term average of 2.12 fish per hour. The 2021 Yellow Perch charter total harvest rate was 0.53 fish per hour (Figure 3), which is also below the long-term mean of 0.68 fish per hour. The targeted Yellow Perch charter harvest rate was 4.36 fish per hour, a 7% increase from 2020 (4.06 fish per hour). In general, Yellow Perch recruitment across the western and central basins of Lake Erie has been relatively low and is responsible for the challenging recreational fishery.

The total harvest of Yellow Perch in the Lake Erie non-charter recreational boat fishery was primarily comprised of age 2-3 fish from the 2018 and 2019 year classes, which contributed 80% of the total harvest by age. Age-4 fish from the 2017 year class accounted for 12% of the total harvest, with smaller contributions from age 1 (2020 year class) and age 5 plus (2016 year class and older) fish (Figure 4). Mean lengths of age 3-5 Yellow Perch in 2021 were high (Figure 5) and well above long-term averages. Yellow Perch reproduction continues to be successful, as evidenced by young-of-year catch rates in the August bottom trawl survey. During 2021 we captured 1,234 age-0 Yellow Perch per 10-minute tow, the highest catch rate observed since the survey began in 2014.

*Walleye*

While the total harvest and harvest rate of Lake Erie Walleye during the 2021 non-charter recreational boat fishery decreased compared to 2020, the fishery remained excellent. A total of 324,650 angler hours were spent harvesting 177,948 Walleye, the second-highest harvest observed since 2006 and 7% below the 14-year high of 191,490 Walleye harvested in 2020. The targeted harvest rate of 0.55 walleye per angler hour in 2021 was the 7th-highest in the 1975-2021 time series (Figure 2). Harvest rates that compare to the past four years, which include the time series record of 0.67 walleye per angler hour in 2018, have not been observed since the early 1980s and are well above the long-term means of 0.37 walleye per angler hour for Michigan waters and 0.43 walleye per angler hour for the western and central basins of Lake Erie.

Walleye fishing in the Lake Erie charter fishery was also strong. The Walleye harvest rate reported by charter operators in 2019 was 0.97 fish per hour, the second highest value observed since 1998 and an increase of 11% from 2020. This harvest rate is also well above the long-term average of 0.72 fish per hour (Figure 3). The 2021 charter targeted harvest rate was 1.11 fish per hour, which is identical to last year.

The below-average Walleye catch-per-unit-effort (CPUE) during the 2021 gill net survey (Figure 6) was due to a lower proportion of fish from the large 2015 year class being represented in the catch, an artifact of the gear's size selectivity. Clearly, the 2015 year class continues to be a strong contributor to the fishery as indicated by fishery-dependent data from the creel survey, which showed that age-6 (2015 year class) Walleye comprised over one-third (38%) of the total harvest in the non-charter sport fishery, more than the next two most prevalent age groups, the 2018 (age 3, 20%) and 2017 (age 4, 17%) year classes, combined (Figure 4). While slightly higher than 2020, the 2021 gill net catch rate of yearling Walleye remained below average for the second year in a row (Figure 7). Age-0 Walleye catch rates from the 2021 trawl survey (12 fish per 10-minute tow) were similar to 2020 (14 fish per 10-minute tow) and above the relatively short time series average of 11 fish per 10-minute tow. Walleye catch rates from inter-agency surveys outside of Michigan waters show continued strong walleye reproduction in Lake Erie's western basin during recent years. Pending good overwinter survival and subsequent recruitment, the 2020 and 2021 year classes should be strong contributors to the Lake Erie Walleye fishery in the future.

*Forage fish*

A total of 17,063 forage fish representing 16 different species were captured during 8 trawl tows in the August trawl survey, for an average CPUE of 2,168 fish per 10-minute tow. Young-of-year Yellow Perch had the highest average CPE (1,234 fish per 10-minute tow). Young-of-year White

Perch (760 fish per 10-minute tow), Round Goby (38 fish per 10-minute tow), Trout-Perch (37 fish per 10-minute tow), Spottail Shiners (27 fish per 10-minute tow), Logperch (22 fish per 10-minute tow), Gizzard Shad (20 fish per 10-minute tow), and young-of-year Walleyes (12 fish per 10-minute tow) were also substantial contributors to the catch. Young-of-year Smallmouth Bass, White Bass, and Freshwater Drum as well as Mimic Shiners, Silver Chubs, Channel Darters, Rainbow Smelt, and Tubenose Gobies were also captured.

The 2021 forage catch rate was above the 85$^{th}$ percentile forage CPUE observed since Michigan's modern-day bottom trawl survey began in 2014. Since this was only the 8$^{th}$ annual trawl survey in recent memory, it is difficult to put the catch rates that we observed into a broader context for the West Basin of Lake Erie. However, Michigan's forage CPUE paralleled that of the decades-long Ontario and Ohio bottom trawl survey, which also indicated increased western basin forage abundance in 2021.

### *Commercial Fishery Summary*

Since 1979 the commercial fishery in Michigan waters of Lake Erie has primarily harvested underused fish species using seines in the shallow embayments along the shoreline, although a license to fish small mesh trap nets has also been active. In 2021, a total of two Michigan commercial fishing licenses, one for seines and one for small-mesh trap nets, were active on Lake Erie. The 2021 commercial harvest included 10 types of fish for a total of 171,618 pounds (Table 2). In combination, Channel Catfish (22%), Common Carp (19%), Goldfish (18%), and White Bass (13%) accounted for 71% of the total harvest by weight. Other harvested fish included Buffalo species, Quillback, White Perch, Bullhead species, Freshwater Drum, and Bowfin. The 2021 total harvest rebounded slightly from 2018 (119,284 total pounds) but was still below the long-term average commercial harvest of 629,099 pounds per year.

## St. Clair River – Lake St. Clair

### *Sport Fishery Summary*

Creel data were not yet available at the time of the writing of this report and are therefore not included.

For the St. Clair-Detroit River System (St. Clair River, Lake St. Clair, and Detroit River), charter boat anglers reported a harvest of 30,249 fish of all species from the American waters of the system. Walleye accounted for (86%) of total charter harvest in 2021.

In 2021, charter boat captains reported a total of 3,563 excursions on the American waters of the St. Clair-Detroit River System, a 77% increase from 2020 (which was reduced due to COVID regulations) and a 41% increase from 2019. Aside from 2020, charter boat excursions have increased each year since 2009.

*Yellow Perch and Walleye*

Charter anglers harvested a total of 25,914 Walleye from the American waters of the St. Clair-Detroit River system, up 2% from 2019 (25,311 fish harvested) and up 158% from 2020 when COVID restrictions greatly reduced fishing effort (10,046 fish harvested). Of these fish, the vast majority (99%) were taken by charters targeting Walleye, and 73% of total harvest occurred in the Detroit River. Total charter harvest rates were 0.36 fish per hour, above the long-term average of 0.23 fish per hour (Figure 8). The targeted charter catch rate of Walleye was 0.68 fish per hour.

There are currently no Walleye-specific survey programs taking place in the St. Clair River and Lake St. Clair. However, Walleye continued to be captured at relatively high rates (4.59 per 24-hour set) in trap nets in Anchor Bay (Table 3) and increased from the last survey in 2019 (see Table 3). Walleye catch rate in the trap net survey was also above the long-term average. Age-0 Walleye are rarely captured during the fall trawl survey, indicating low levels of reproduction from Lake St. Clair and its tributaries.

Yellow Perch reproductive success as indexed by age-0 catch rate in the fall trawl survey decreased since our last survey in 2019 and was the lowest observed since 2002 (Figure 9). However, reproductive success doesn't necessarily correlate with recruitment to the adult population in Lake St. Clair. For example, the 2017 age-0 Yellow Perch catch rate in the fall trawls was the second highest since 2010; however, this did not translate to higher catch rates of age-1 fish in the spring 2018 trawls (Figure 10).

Growth of Yellow Perch in Lake St. Clair continues to be below the statewide average. Mean-length-at-age for Yellow Perch is below the statewide average at all consistently observed ages (age-1

to age-5; Figure 11). Additionally, Yellow Perch growth is lower than it has been historically as seen by mean-length-at-age estimates from pervious time periods (Figure 11).

*Black Bass (Smallmouth Bass and Largemouth Bass)*

Charters targeting Smallmouth Bass in the St. Clair-Detroit River System captured and released 22,794 fish in 2021, up substantially when compared to pre-covid 2019 data (14,539 total). A total of 1,091 fish were harvested, resulting in a total release rate of about 95%. Targeted Smallmouth Bass catch rates were 1.28 fish per hour, down slightly from pre-covid 2019 (1.42 fish per hour), indicating that the increased catch resulted from an increase in fishing effort.

Statistics from the Master Angler program indicate that Lake St. Clair is the premier waterbody in the state for trophy Smallmouth Bass (Figure 12). With 32 entries in the Master Angler program in 2021, Lake St Clair represented 29% of the total Smallmouth Bass entries statewide, with a further 8 master angler Smallmouth Bass reported in the St. Clair River and two from the Detroit River. The continued strong representation of Lake St. Clair and adjoining waters in the Smallmouth Bass statewide Master Angler program is likely a reflection of an abundance of trophy-size Smallmouth Bass in the lake, a high degree of angler effort targeting the species, and widespread practice of catch-and-release among Smallmouth Bass anglers.

A total of 85 Smallmouth Bass were captured in the spring Anchor Bay trap net survey for a catch rate of 1.32 fish per 24-hour set, which was down from 2019 (3.82 fish per 24-hour set), and below the long-term average of 4.0 fish per 24-hour set (Table 3; 2002-2021). Unseasonably cool temperatures likely suppressed Smallmouth Bass catch rates during the Anchor Bay trap net survey in 2021. Of these 85 captures, 77 individuals received jaw tags, with the remainder being too small to tag or being recaptures from previous years. Additionally, 22 fish were also tagged with an internal acoustic tag which will provide detailed movement data. Concurrent with our spring trap net survey, we sampled additional Smallmouth Bass by electrofishing near the “Mile Roads” area of Lake St. Clair, east of St. Clair Shores. An additional 83 Smallmouth Bass were sampled, of which all fish received jaw tags, and 19 fish also received acoustic tags which will provide detailed movement data. Additionally, we conducted some exploratory electrofishing efforts near the Selfridge Boating Access Site and captured 31 Smallmouth Bass all of which received jaw tags. As a result of these efforts, we handled a total of 200 Smallmouth Bass during the spring 2021 season. Valid age estimates were obtained for 198 individuals. Analysis of age composition and annual mortality includes individuals from both trap netting and electrofishing efforts pooled together. The 2016 year-class (age-5, 31%) and the 2015 (age-6, 17%) were the two most abundant year classes in the 2021 sample. Generally, year-class contribution to Smallmouth Bass catch was relatively uniform; with additional steady contributions from the 2018, 2017, 2014, 2013, 2012 and 2011 year-classes (range 6-10% of the sample). Finally, a robust 7% of the catch was comprised of Smallmouth Bass age-11 years or older, demonstrating survival to ages capable of producing the large-sized fish prized by anglers. Smallmouth Bass total length averaged 16.6 inches in all sampling efforts with the smallest individual sampled measuring 11.3 inches and the largest 20.9 inches. We are only able to accurately weigh fish during our trap net survey; weights were obtained for 84 of the 85 individuals sampled with an average weight of 2.9 lbs. We estimated proportional size distributions for Smallmouth Bass, which can be thought of as the percent of the adult population (considered 8 inches in total length or larger for this exercise) that is larger than a given threshold. We calculated these values for fish 14, 17, and 20 inches and greater. In 2021, 89% of adult Smallmouth Bass we caught were 14 inches or larger, 41% were 17 inches or larger, and 3% were 20 inches or larger (Figure 13). The values for fish 17- and 20-inches or larger both declined from 2019 (no sample in 2020 due to COVID-19 restrictions). This decline may have been influenced by the small number of fish captured in trap nets in 2021 but is, nevertheless, something we will be keeping our eye on in the years moving forward. The annual mortality rate was estimated using catch curve analysis which assumes that abundance of year classes in a given sample is related to the population mortality rate. For 2021 the annual mortality rate was estimated at 27.2%, maintaining an overall flat trend since 2002 (Figure 14). This suggests no change in Smallmouth Bass mortality has occurred across the time series.

Since 2002, a total of 5,717 Smallmouth Bass captured in survey trap nets in Anchor Bay have been tagged and released. Smallmouth Bass movements appear rather localized, with nearly all the Smallmouth Bass tag recoveries reported to date coming from the Michigan waters of Lake St. Clair. The northernmost Smallmouth Bass tag recovery has been from the Port Huron area of the St. Clair River, and the southernmost recovery came from the Oak Harbor area in Ohio waters of Lake Erie. On average, recaptured Smallmouth Bass tagged during 2002-2019 traveled less than 6 mi (9.7 km) from the Anchor Bay tagging site.

In 2021, Michigan tagged a total of 108 Smallmouth Bass with non-reward jaw tags in Anchor Bay of Lake St. Clair. A total of 10 non-reward tags placed on Smallmouth Bass in 2021 were recovered by anglers for a single-season reporting rate of 9.3%. Interestingly, this return rate was largely driven by the small number of fish tagged near the Selfridge Boating Access Site where 5 of 31 tagged fish were reported captured (16.1% reporting rate), compared to 5 of the 77 trap net captured fish were reported captured (6.5% reporting rate).

A total of nine (of 83) non-reward tags placed on Smallmouth Bass tagged in the Mile Roads area during 2021 were recovered by anglers for a single season reporting rate of 10.8%, similar to the overall reporting rate in Anchor Bay, and intermediate between the reporting rate of fish captured in trap nets (6.5%) and fish captured near the Selfridge Boating Access Site (16.1%).

Recruitment of age-0 Smallmouth Bass as indexed by our August Lake St. Clair Trawl survey was down to 1.1 age-0 Smallmouth Bass per acre trawled (Figure 15; 2019 value: 2.2 Smallmouth Bass per acre trawled). The average size of age-0 recruits, which is a critical indicator of overwinter survival, was 3.0 inches, slightly below the long-term average (1996-2019 average age-0 Smallmouth Bass length: 3.1 inches), but up slightly from 2019 (2.9 inches). Age-0 Smallmouth Bass were among the most captured species in our new nearshore assessment program conducted in coordination with the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry and the U.S. Fish and Wildlife Service. We will be exploring the possibility of establishing a new recruitment index for Smallmouth Bass using a subset of sites sampled with small mesh fyke nets during this program. While monitoring of age-0 Smallmouth Bass abundance is a useful indicator of summer conditions and nesting success, strong compensatory effects are known to occur for Smallmouth Bass, such that a strong or weak year class is not necessarily correlated with high abundance of adults in the future.

During the fall nearshore electrofishing survey 237 Largemouth Bass of all sizes were captured (2 to 20 inches). Total catch rates of Largemouth Bass have varied from 17.4 fish per 10-minutes of shocking in 2016 to a low of 7.7 fish per 10-minutes of shocking in 2017. The average catch rate of Largemouth Bass was 7.9 fish per 10-minutes of shocking in 2021. The size structure of Largemouth Bass indicated many large, catchable-sized individuals, and no apparent cropping at the legal harvest size. Moving forward the nearshore survey will provide a strong basis for evaluating the size structure and recruitment of Largemouth Bass in Lake St. Clair.

*Muskellunge and Northern Pike*

No Muskellunge were reported harvested from Lake St. Clair in 2021. One fish was reported harvested from both the Detroit River and the St. Clair River. The first year of mandatory harvest reporting of Muskellunge in the State of Michigan was 2018, when five Muskellunge were registered as harvested from Lake St. Clair. Anglers are reminded to report harvested Muskellunge within 24 hours by visiting www.michigan.gov/registerfish or calling 1-844-345-3474.

Charter captains reported a total catch of 979 Muskellunge in 2021 throughout the American waters of the St. Clair – Detroit River System, with zero fish harvested. Charter targeted catch rates were 0.07 fish per angler hour.

Lake St. Clair continued to dominate the statewide Master Angler entries for Muskellunge. A total of 15 Master Angler Muskies were reported for Lake St. Clair in 2021 (Figure 16) representing 47% of total entries statewide.

No Muskellunge were captured during the 2021 Trap Net Survey.

A total of three age-0 Muskellunge were captured during our fall nearshore electrofishing survey for a catch rate of 0.06 fish/10-min shocking. This value was up slightly 0.05 fish/10-min shocking in 2019. Over time this annual Muskellunge

recruitment index will provide valuable information about the success of Muskellunge spawning, as well as the spatial distribution of age-0 Muskellunge within Michigan waters of Lake St. Clair.

We captured a total of 45 Northern Pike during our spring trap net survey in Anchor Bay. Valid age estimates were obtained for 44 individuals. The majority of the catch was comprised of the 2017 (27%) and 2016 (30%) year classes. Across all individuals captured the average length was 29.9 inches; total length ranged from 25 inches to 36.4 inches.

*Lake Sturgeon*

Harvested Lake Sturgeon have been required to be registered with the MDNR since 1999. In 2021, 10 Lake Sturgeon were reported harvested. This is above the long-term average since 1999 (6.7 registered as harvested per year) and below the 10-year average (11 registered as harvested per year since 2012; Figure 17).

Charter captains reported 131 trips with a total of 377 anglers targeting Lake Sturgeon in the St. Clair-Detroit River System in 2021. These are both increases from 2020 (120 trips and 320 anglers in 2020). Average catch rates of 3.1 Lake Sturgeon per trip and 0.2 Lake Sturgeon per angler hour were reported, both increases from 2020.

Anglers reported 117 Master Angler Lake Sturgeon from the St. Clair River and Lake St. Clair in 2021. These represent 96% of all Master Angler Lake Sturgeon reported statewide in 2021 and is easily the highest ever reported (the previous high was 64 fish in 2020), continuing an increasing trend (Figure 18). Anglers reported catching 67 Lake Sturgeon that had previously been tagged by the MDNR. This was the highest number of tagged Lake Sturgeon ever reported, surpassing the previous record of 54 that was set in 2019 and also continuing an increasing trend (Figure 19).

A total of 156 Lake Sturgeon were collected during assessment surveys on Lake St. Clair and the St. Clair River in 2021. Captured Lake Sturgeon averaged 43.8 inches in total length, ranging from 12.6 inches to 72.5 inches. A total of 120 Lake Sturgeon were caught in the St. Clair River during the annual setline survey in June, 35 Lake Sturgeon were caught during our targeted Lake Sturgeon trawl survey in Lake St. Clair during August, and one Lake Sturgeon was caught during our fall forage trawl survey. The length frequency for setline and trawl-captured Lake Sturgeon in 2021 illustrates the higher proportion of large individuals in the trawl catch in the lake (Figure 20). We suspect this reflects a difference in the actual size structure of the Lake Sturgeon population present in the lake during the summer, rather than a product of differences in size bias between the two survey gear types. Survey setlines were modified in 2002 to include small hooks, providing a less biased sample of the Lake Sturgeon population in the St. Clair River. Of note, 2021 had the highest catch rate of juvenile Lake Sturgeon since our survey began.

In addition to sampling Lake Sturgeon, each setline is also set with two minnow traps, one attached to each end. These traps target Northern Madtom, a small catfish species that is endangered in the State of Michigan and Province of Ontario. Each trap is baited with earthworms, which experimentation in past years has suggested as being the preferred bait. A total of 84 Northern Madtoms were caught in 2021. Northern Madtoms have very specific habitat and water quality requirements, making them a sensitive indicator of environmental quality. The high catch rate suggests high quality habitat conditions exist in the St. Clair River at this time.

A total of 3,576 Lake Sturgeon have been tagged and released in the St. Clair River and Lake St. Clair since 1996. To date, 1,085 tagged Lake Sturgeon have been recaptured with survey gear or reported by fishermen. A total of 601 tagged sturgeon have been recovered with survey setlines. One was recovered in a survey trap net in Anchor Bay, one in a survey gill net, and 19 have been recaptured in assessment trawls on Lake St. Clair. Sport anglers have reported 430 recoveries, most from the North Channel of the St. Clair River. Twenty-six recoveries have been reported from the Ontario commercial trap net fishery in southern Lake Huron, approximately 70 km (43.5 mi) from the tag site. Seven recoveries have been made on Lake Sturgeon that were found dead from boat strikes or unknown causes.

*Forage fish community*

Total catch in our spring and fall Lake St. Clair forage surveys was especially low in 2021. Total catch (by number of fish) in the spring trawl survey was lowest since 2003 and fall trawls the lowest since at least 2001. However, some shiner species did increase in our spring trawl survey since our

previous survey in 2019. We captured 115.3 Spottail Shiners per acre trawled in our spring trawls, up from 86.6 fish per acre trawled in 2019 and the highest catch rate observed since 2012 (but well below the long-term average of 458.1). Emerald Shiner catch also increased with 13.1 caught per acre trawled compared to zero caught in 2017, 2018, and 2019 and was the highest catch since 2009 (above the long-term average of 4.8). Along with Spottail Shiner and Emerald Shiner, Logperch (6.5 fish per acre trawled) and Rainbow Smelt (4.5 fish per acre trawled) were the most common forage-sized fish captured during spring trawls.

During our fall trawl survey only six forage-sized fish were caught: three age-0 Smallmouth Bass (0.9 per acre trawled), two age-0 Yellow Perch (0.6 per acre trawled), and one Channel Darter (0.3 per acre trawled).

Brook Silversides were again the most frequently captured (62.8 fish per 10-minute sample period) forage-sized fish during our fall nearshore electrofishing survey. This value was up from 2020 (33.9 fish per 10-minute sample period) and the highest observed across the six-year time frame. Other key forage species captured included Emerald Shiners (28.2 fish per 10-minute sample period) and Spottail Shiners (13.6 fish per 10-minute sample period). While still a relatively new survey, the nearshore electrofishing survey provides important additional insight into the lake's forage fish community, which can in time be compared to our traditional trawl surveys to provide a more complete picture of the status and trends of Lake St. Clair forage species and their potential availability to sportfish.

### *Commercial Fishery Summary*

No state regulated commercial fishery exists in the Michigan waters of the St. Clair River or Lake St. Clair.

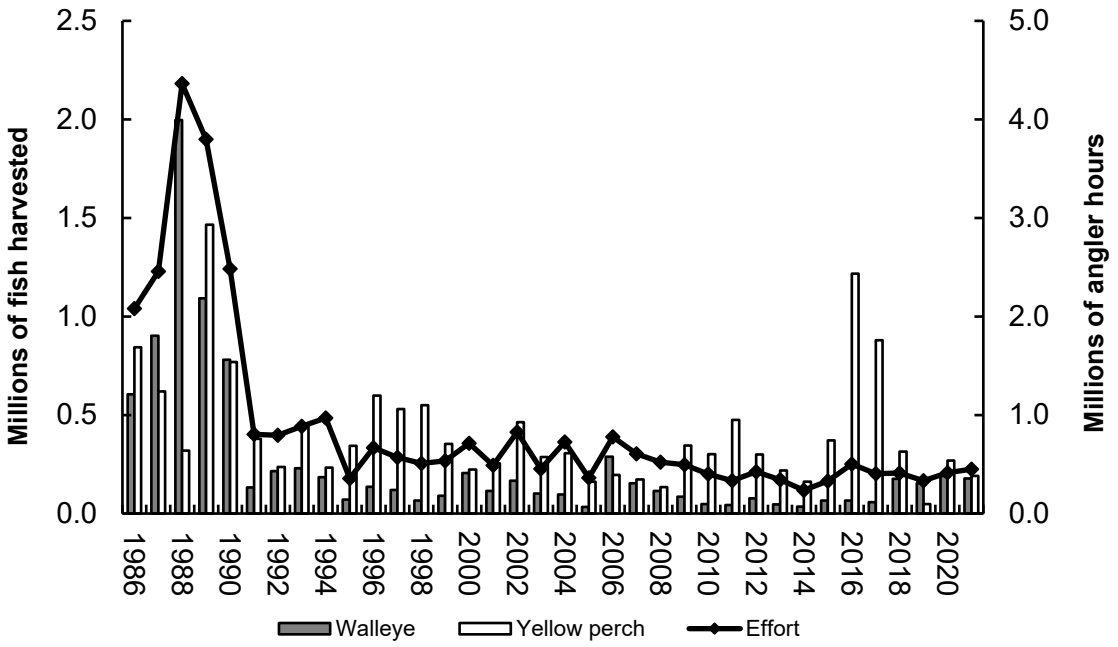


Figure 1. Estimated Walleye and Yellow Perch harvest and total angler effort for Michigan's Lake Erie sport fishery, 1986-2021.

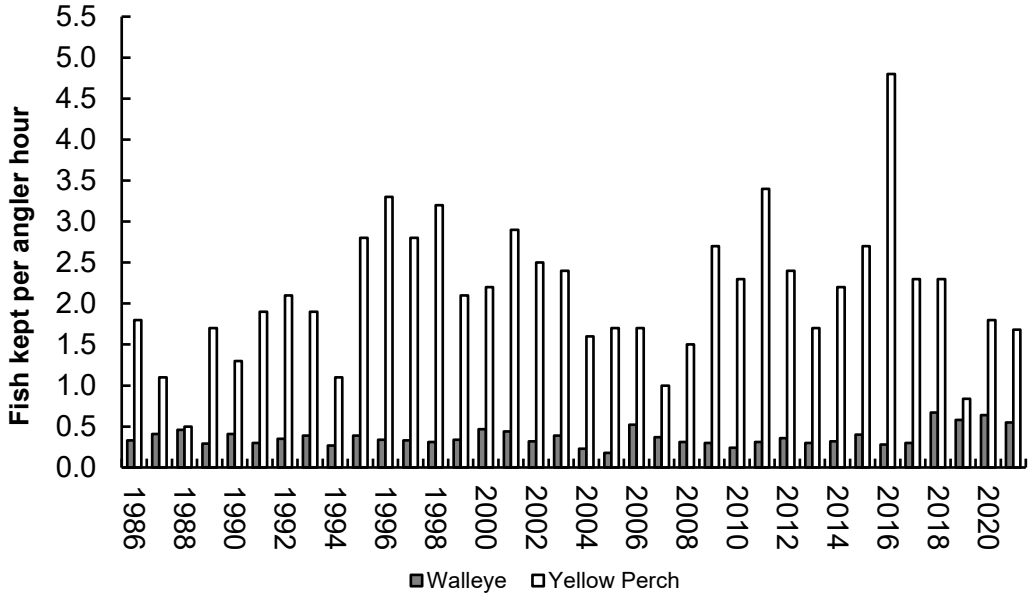


Figure 2. Walleye and Yellow Perch targeted harvest rates (fish per hour) for Michigan's Lake Erie sport fishery, 1986-2021.

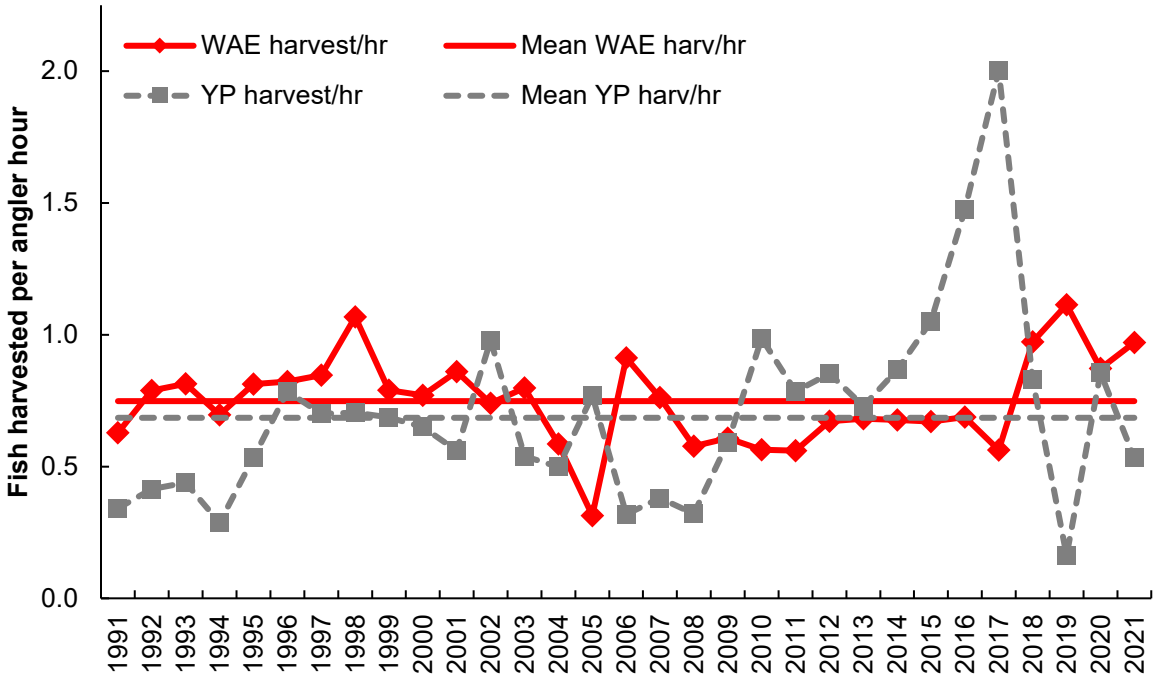


Figure 3. Michigan Lake Erie charter boat non-targeted harvest rates for Walleye and Yellow Perch, 1991-2021.

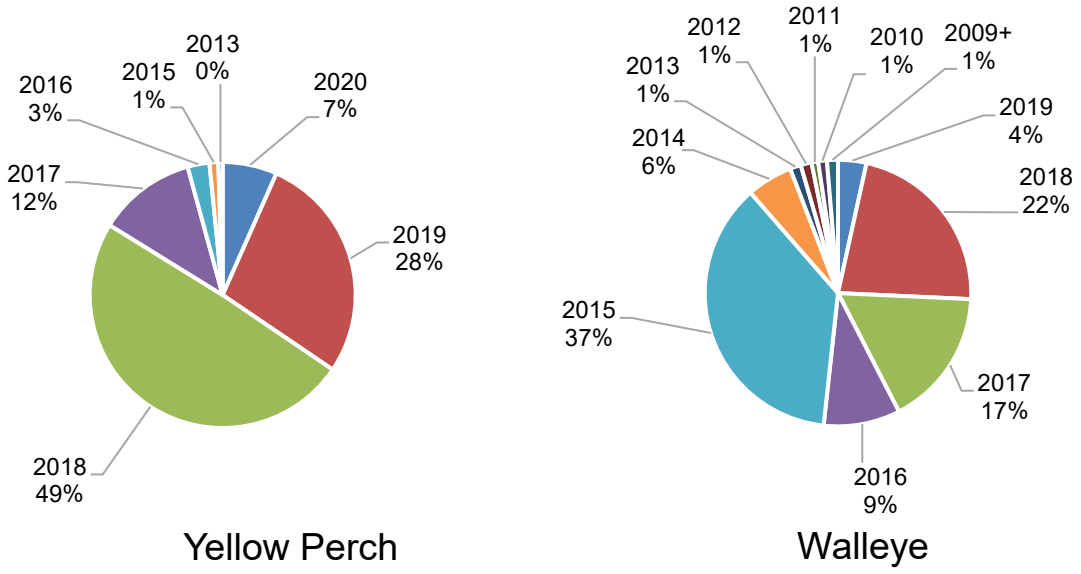


Figure 4. Year-class contribution to Michigan sport harvest for Yellow Perch and Walleye from Lake Erie in 2021.

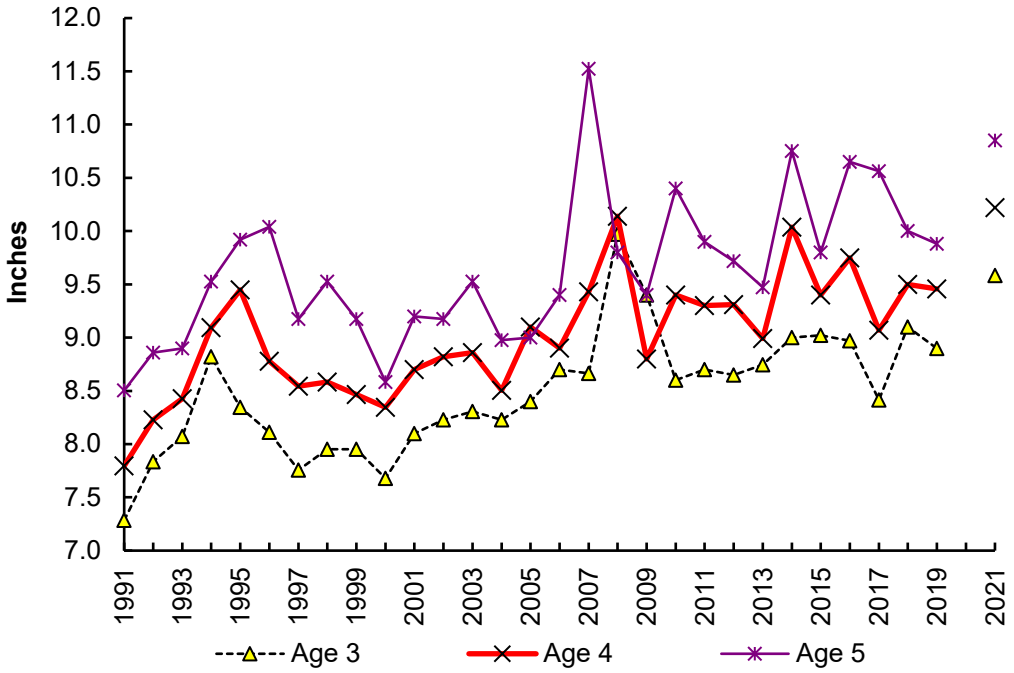


Figure 5. Mean length at age for sport-harvested Yellow Perch from Michigan's waters of Lake Erie, 1991-2021.

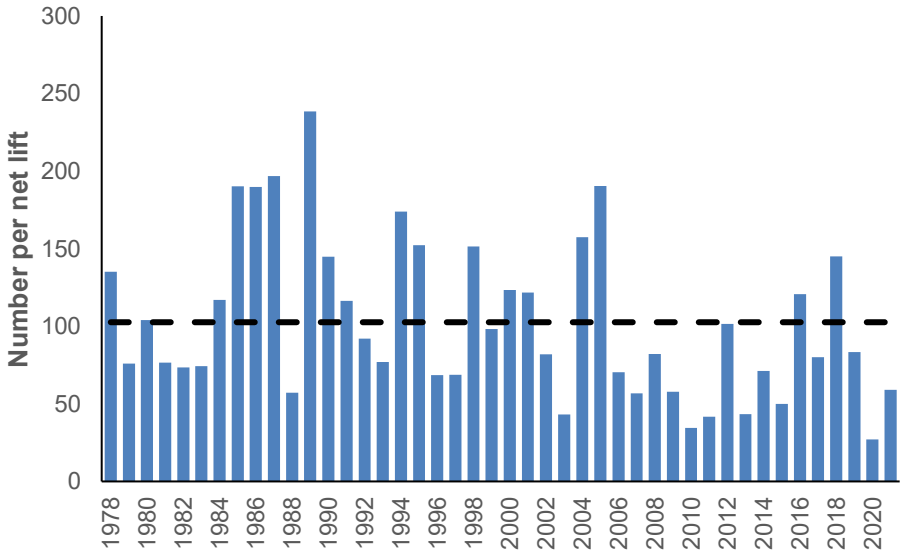


Figure 6. Average total Walleye catch per unit effort, by year for Michigan Lake Erie index gill nets, 1978-2021. The horizontal line represents the average for the time series.

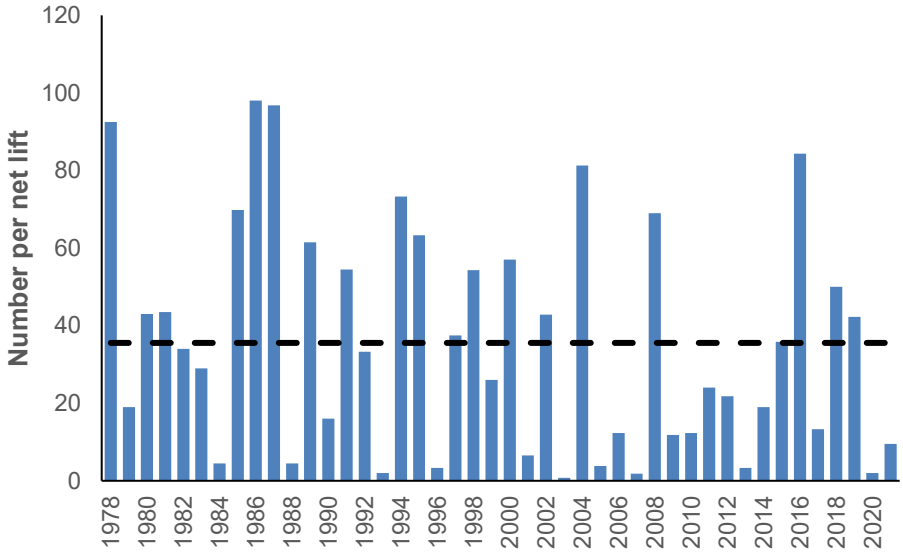


Figure 7. Average yearling Walleye catch per unit effort for Michigan Lake Erie index gill nets, 1978-2021. The horizontal line represents the average of the time series.

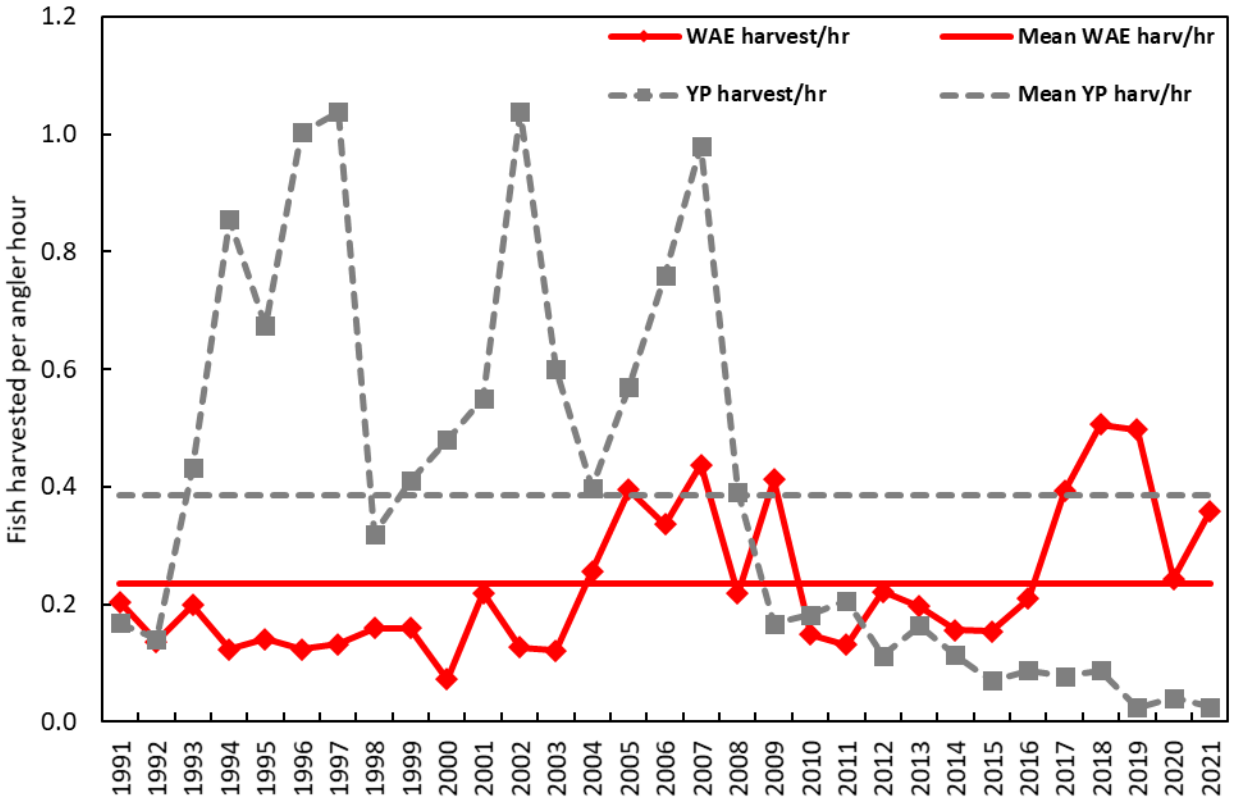


Figure 8. Michigan St. Clair-Detroit River system charter boat harvest rates (total harvest rates) for Walleye and Yellow Perch, 1991-2021.

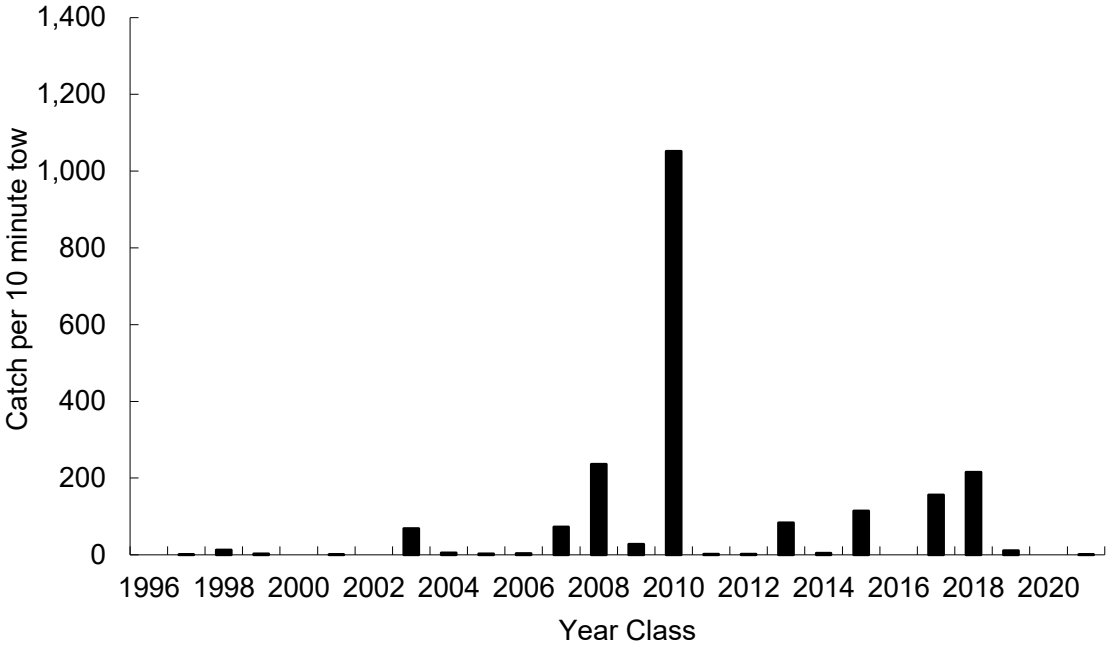


Figure 9. Year-class strength for Yellow Perch in Lake St. Clair as indicated by fall trawl age 0 catch rates, 1996-2021. Note: No trawling occurred in 2016 or 2020.

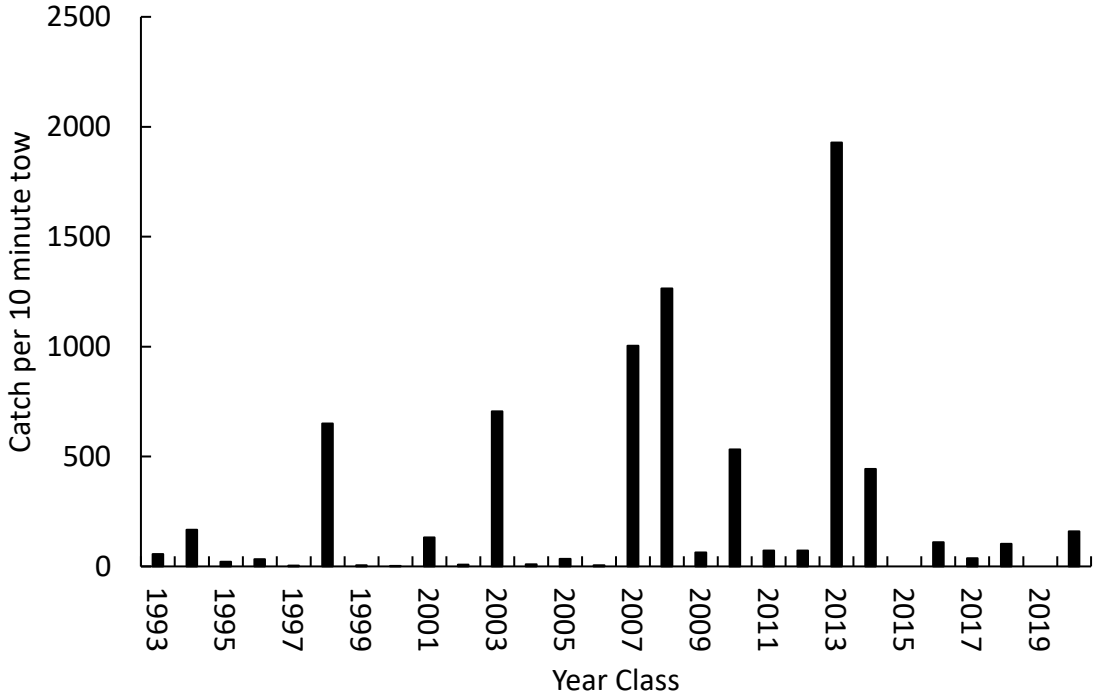


Figure 10. Strength of Yellow Perch year classes as assessed by June trawls, 1993-2021. Note: Survey year is year class + 1.

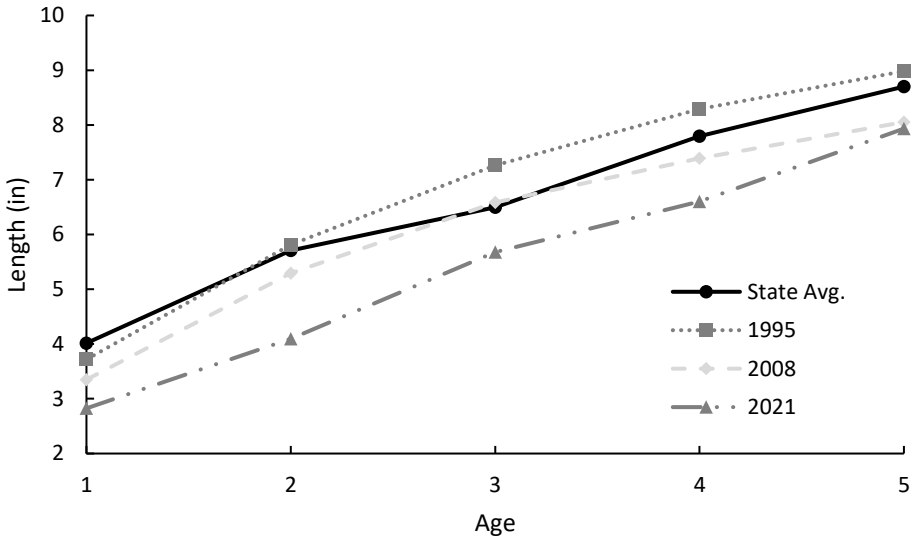


Figure 11. Average length-at-age for Yellow Perch caught in June trawls on Lake St. Clair over three sampling time periods and compared to the state average.

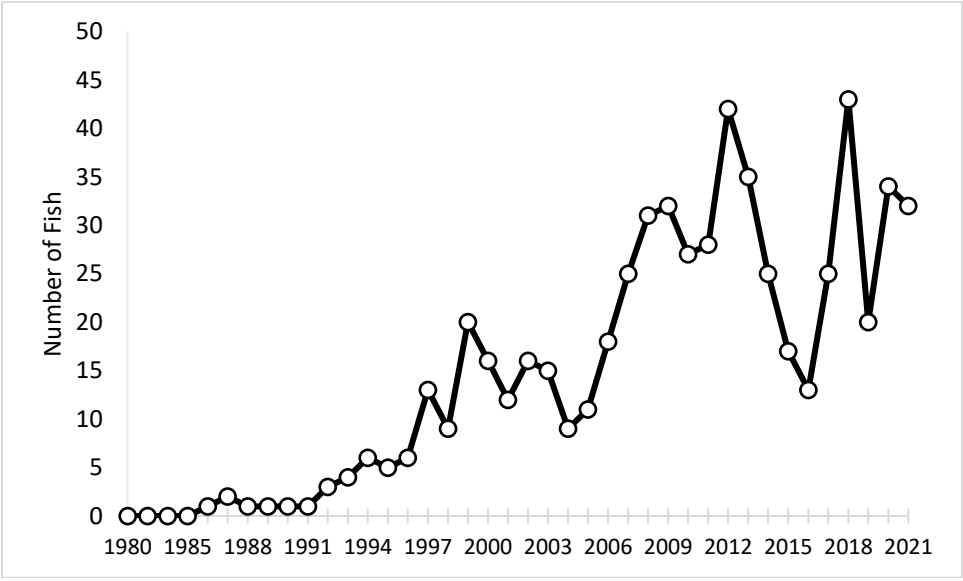


Figure 12. Lake St. Clair Smallmouth Bass entered in the Michigan DNR Master Angler Program (21-inch minimum for qualification), 1986-2021.

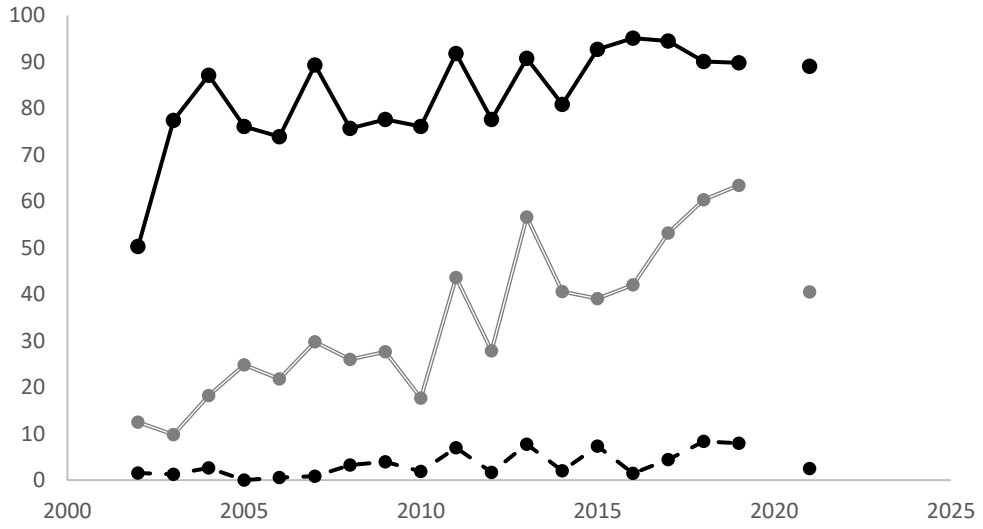


Figure 13. Proportional size distributions of adult Smallmouth Bass for Lake St. Clair, 2002-2021. Lines represent fish 14-inches and larger (solid black line), 17-inches and larger (double grey line), and 20-inches and larger (dashed black line).

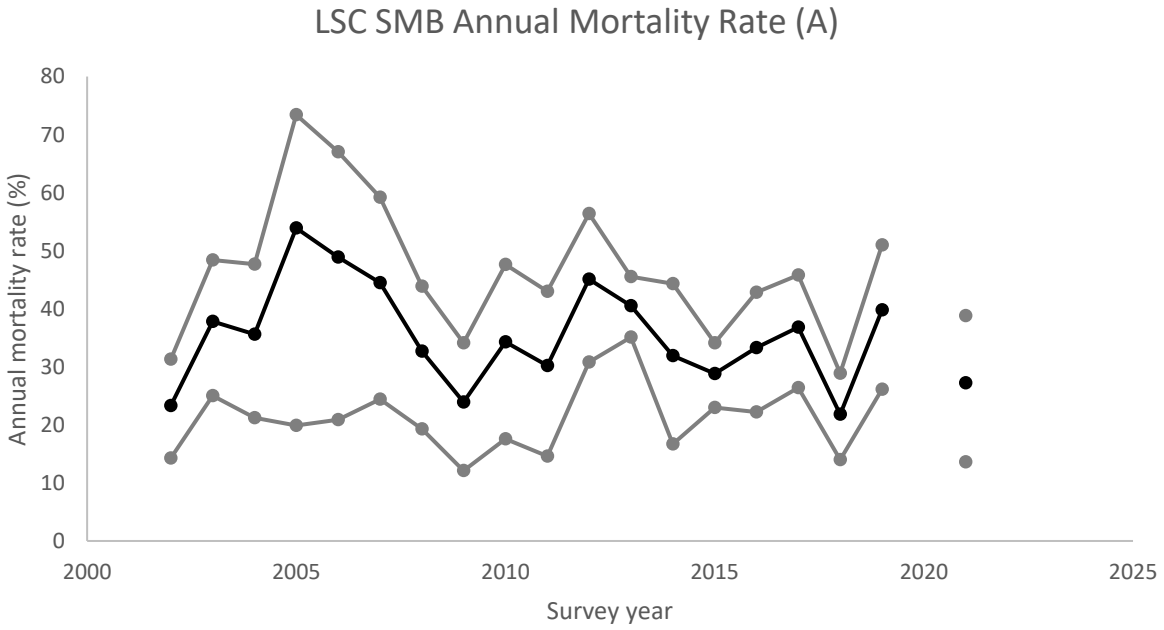


Figure 14. Smallmouth Bass annual mortality rates for Lake St. Clair, 2006-2021, estimated from catch curve regression. Black line and points represent estimates, grey lines represent the upper and lower 95% confidence interval.

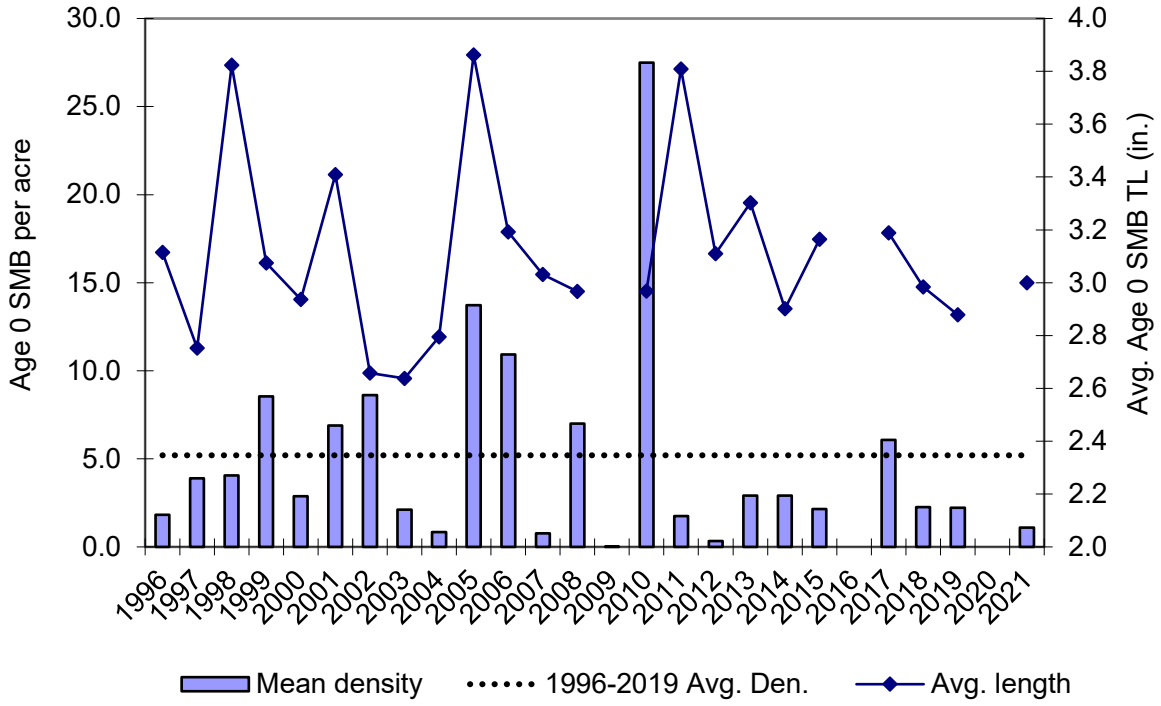


Figure 15. Year-class strength for Lake St. Clair Smallmouth Bass as indicated by fall age-0 catch rates (bars) and average length (solid line), 1996-2021. Average year class strength indicated by the horizontal dashed line.

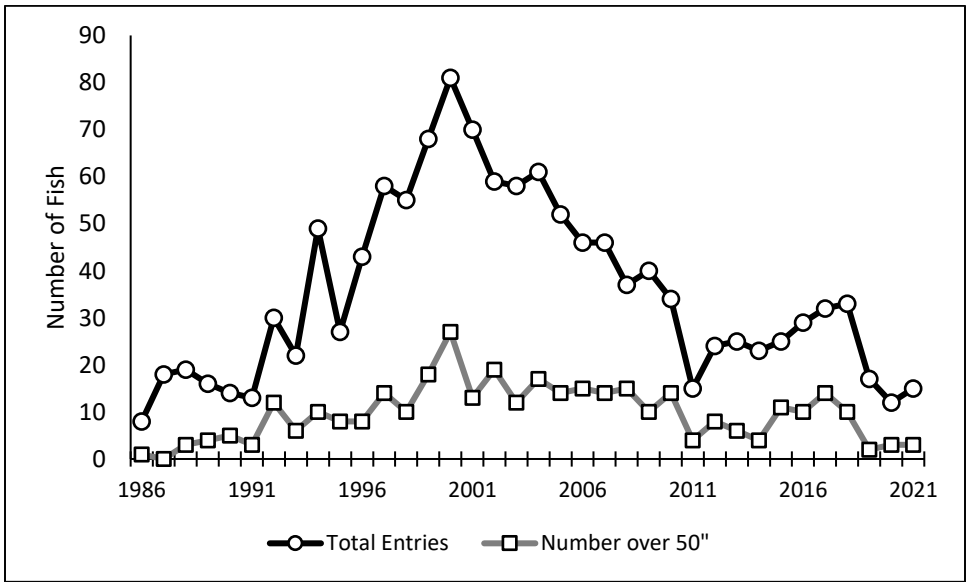


Figure 16. Lake St. Clair Muskellunge entered in the Michigan DNR Master Angler Program (46-inch minimum for qualification), 1986-2021.

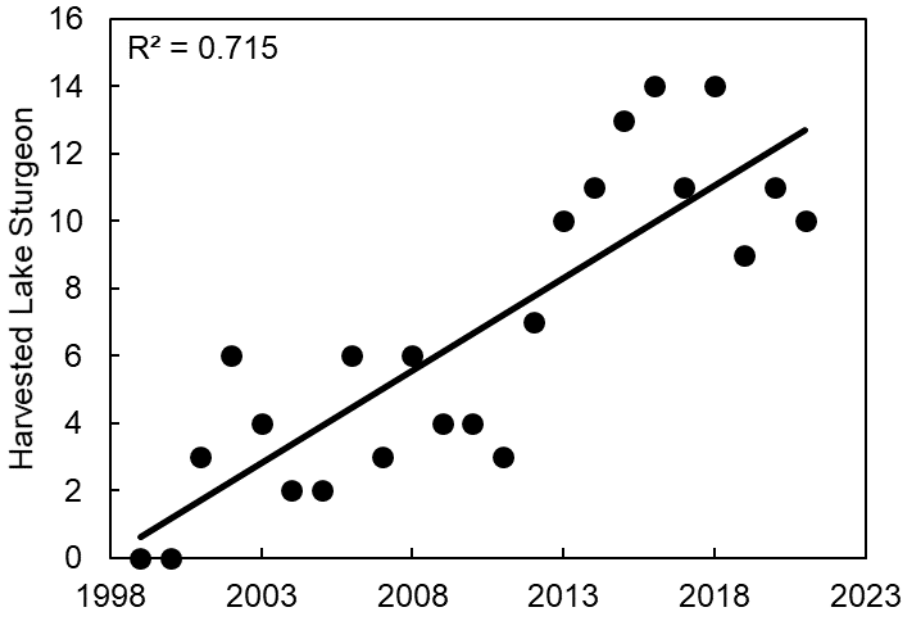


Figure 17. Number of Lake Sturgeon registered by recreational anglers as harvested from the St. Clair system by year, 1999-2021. Solid black line indicates a significant trend.

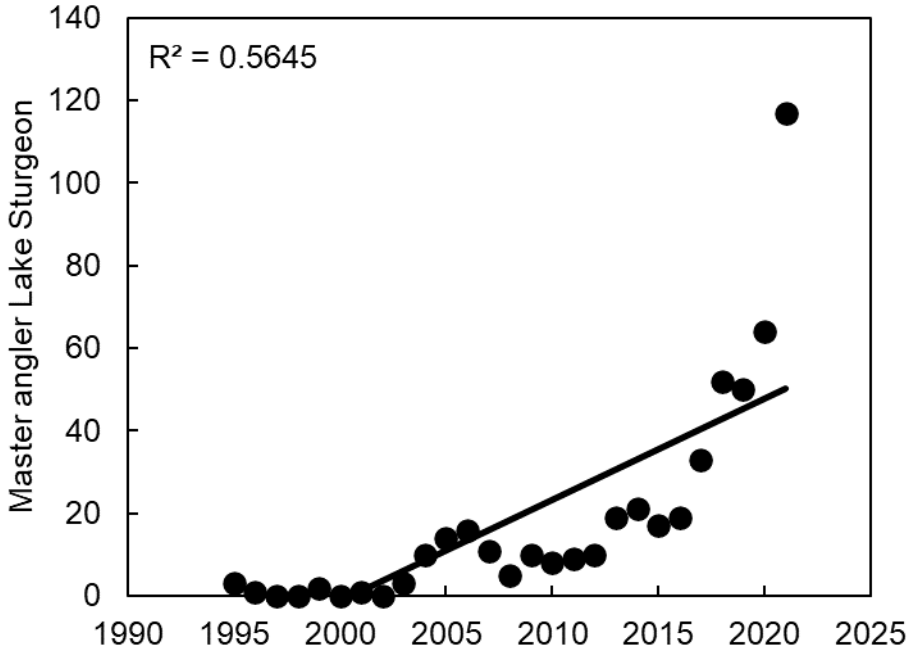


Figure 18. Master Angler Lake Sturgeon (minimum entry length is 50 inches) reported by year for the St. Clair-Detroit River System, 1995-2021. Solid black line indicates a significant trend.

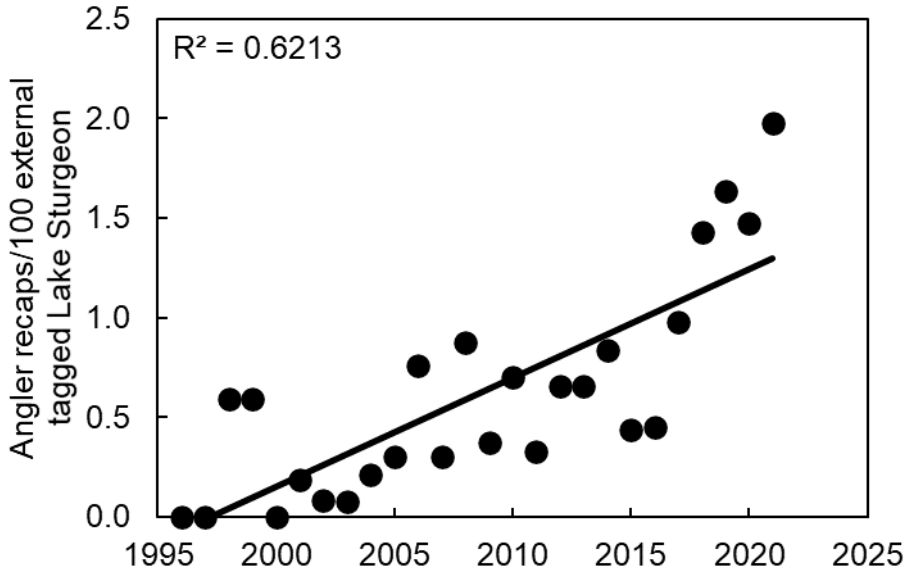


Figure 19. Reported recaptures of MDNR-tagged Lake Sturgeon by anglers in the St. Clair-Detroit River System by year corrected for number of tagged Lake Sturgeon available to catch (number of recaptures per 100 externally tagged Lake Sturgeon), 1996-2021. Solid black line indicates a significant trend.

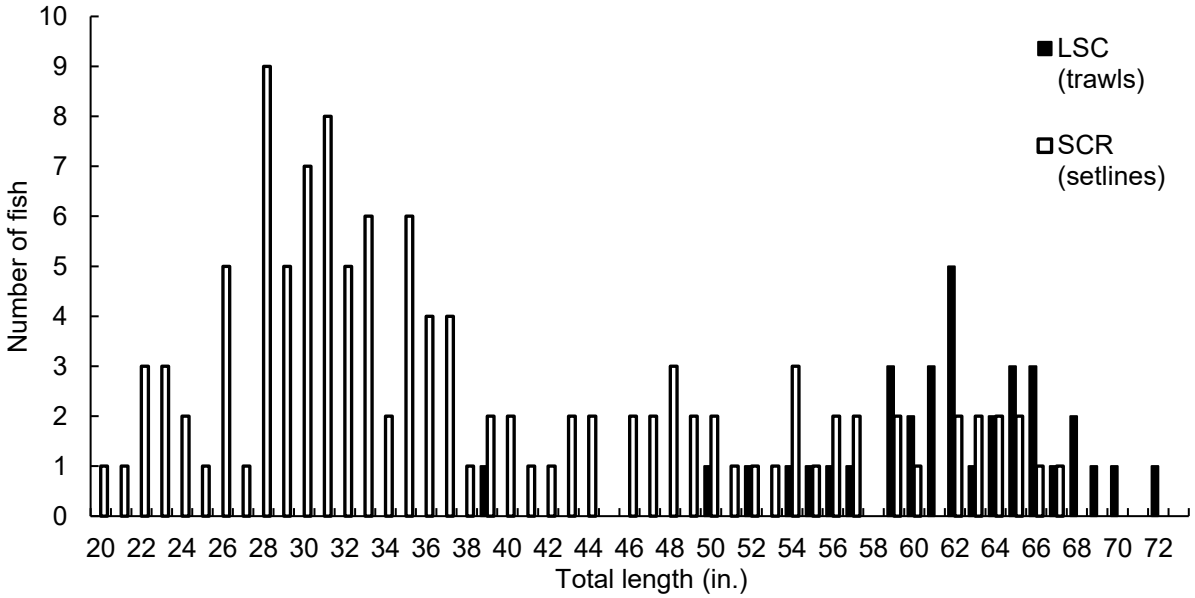


Figure 20. Length frequency distribution for Lake Sturgeon caught in 2021 with survey setlines in the St. Clair River (SCR), and bottom trawls in Lake St. Clair (LSC).

Table 1. Estimated harvest, total harvest rate, effort and released catch for Michigan's 2021 Lake Erie non-charter boat fishery. Harvest and release rates for Yellow Perch and Walleye, noted by the asterisk, are calculated from targeted angler effort focused on these species. All other harvest and release rates are calculated from total angler effort.

| | Harvest | Month | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Species | rate (fish/hr) | Apr | May | Jun | Jul | Aug | Sep | Oct | Season |
| **HARVEST** | | | | | | | | | |
| Yellow Perch* | 1.676 | 73 | 716 | 2,825 | 10,678 | 30,768 | 45,361 | 100,544 | 190,965 |
| Walleye* | 0.548 | 32,933 | 49,113 | 64,922 | 24,141 | 6,564 | 121 | 153 | 177,948 |
| Channel Catfish | 0.006 | 35 | 270 | 211 | 1,322 | 316 | 213 | 164 | 2,531 |
| White bass | 0.017 | 1,539 | 4,659 | 670 | 418 | 77 | 249 | 47 | 7,660 |
| White Perch | 0.006 | 16 | 1,056 | 541 | 175 | 306 | 518 | 63 | 2,676 |
| Freshwater Drum | 0.002 | 75 | 336 | 49 | 76 | 43 | 125 | 7 | 710 |
| Smallmouth Bass | <0.001 | 0 | 28 | 32 | 39 | 74 | 11 | 0 | 184 |
| Total Harvest | 0.857 | 34,776 | 56,267 | 69,421 | 37,195 | 38,212 | 48,403 | 101,252 | 385,526 |
| **EFFORT** | | | | | | | | | |
| Angler hours | | 71,252 | 100,063 | 86,575 | 64,048 | 51,703 | 38,506 | 37,589 | 449,736 |
| Angler trips | | 12,908 | 19,571 | 18,808 | 15,556 | 11,005 | 7,984 | 7,800 | 93,632 |
| **RELEASED** | | | | | | | | | |
| Yellow Perch* | 0.662 | 141 | 181 | 469 | 2,860 | 10,431 | 13,370 | 47,919 | 75,372 |
| Walleye* | 0.031 | 5,475 | 1,655 | 1,829 | 675 | 439 | 7 | 33 | 10,113 |
| Largemouth Bass | 0.025 | 231 | 350 | 2,624 | 3,456 | 1,017 | 2,208 | 1,268 | 11,154 |
| Smallmouth Bass | 0.008 | 261 | 109 | 325 | 402 | 2,164 | 281 | 86 | 3,627 |
| White bass | 0.245 | 15,897 | 50,039 | 15,108 | 9,711 | 6,044 | 8,233 | 5,272 | 110,303 |

Table 2. Commercial harvest (pounds caught) of selected species from Michigan waters of Lake Erie, 1982-2021.

| Year | Buffalo | Bullhead | Common Carp | Channel Catfish | Gizzard Shad | Goldfish | Quillback | Freshwater Drum | Sucker | White Bass | White Perch | Whitefish | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 | 22,474 | 58 | 676,896 | 20,354 | 76,000 | 0 | 1,430 | 608 | 178 | 1,742 | 0 | 0 | 799,740 |
| 1983 | 7,837 | 997 | 622,604 | 28,990 | 665,000 | 0 | 1,510 | 3,555 | 185 | 12,042 | 0 | 0 | 1,342,720 |
| 1984 | 789 | 152 | 422,571 | 9,208 | 1,265,200 | 0 | 56,061 | 116 | 44 | 2,041 | 0 | 0 | 1,756,182 |
| 1985 | 7,885 | 7,340 | 738,857 | 9,253 | 878,000 | 0 | 80,018 | 905 | 1,378 | 4,764 | 0 | 0 | 1,728,400 |
| 1986 | 14,732 | 7,687 | 367,310 | 11,183 | 0 | 0 | 2,217 | 2,032 | 123 | 1,397 | 0 | 0 | 406,681 |
| 1987 | 17,814 | 4,462 | 685,395 | 39,603 | 0 | 551 | 1,062 | 1,825 | 88 | 4,142 | 0 | 0 | 754,942 |
| 1988 | 9,471 | 5,421 | 417,365 | 15,208 | 0 | 188 | 1,380 | 1,180 | 0 | 1,049 | 0 | 0 | 451,262 |
| 1989 | 19,549 | 3,572 | 194,320 | 11,481 | 0 | 2,951 | 568 | 0 | 0 | 991 | 0 | 0 | 233,432 |
| 1990 | 40,064 | 488 | 158,151 | 2,025 | 0 | 877 | 0 | 0 | 0 | 0 | 0 | 0 | 201,605 |
| 1991 | 0 | 704 | 206,244 | 1,941 | 0 | 466 | 6,894 | 0 | 0 | 19 | 8 | 0 | 216,276 |
| 1992 | 0 | 444 | 251,365 | 2,929 | 2,845 | 1,025 | 30,204 | 290 | 0 | 357 | 10 | 0 | 289,469 |
| 1993 | 0 | 844 | 238,805 | 9,152 | 395 | 501 | 28,175 | 4,206 | 0 | 1,180 | 0 | 0 | 283,258 |
| 1994 | 0 | 659 | 94,662 | 5,760 | 2,103 | 111 | 8,930 | 111 | 0 | 1,819 | 0 | 0 | 114,155 |
| 1995 | 0 | 827 | 329,262 | 16,168 | 23 | 517 | 66,013 | 39,673 | 436 | 1,850 | 64 | 0 | 454,833 |
| 1996 | 104 | 828 | 387,671 | 24,969 | 36,996 | 7,138 | 73,662 | 48,218 | 4,286 | 2,923 | 45 | 0 | 586,840 |
| 1997 | 91,877 | 744 | 325,433 | 17,936 | 24,494 | 10,497 | 33,937 | 8,823 | 72 | 7,306 | 4 | 0 | 521,123 |
| 1998 | 15,721 | 2,139 | 620,015 | 16,573 | 4,988 | 6,862 | 22,990 | 24,507 | 6,180 | 1,326 | 0 | 0 | 721,301 |
| 1999 | 25,894 | 7,050 | 211,055 | 7,561 | 6,200 | 0 | 0 | 265 | 1,945 | 23 | 0 | 0 | 259,993 |
| 2000 | 27,843 | 1,742 | 313,200 | 14,400 | 4,595 | 3,025 | 0 | 0 | 0 | 1,776 | 0 | 0 | 366,581 |
| 2001 | 24,393 | 1,197 | 185,495 | 16,328 | 55 | 8,281 | 310 | 2,935 | 0 | 492 | 0 | 0 | 239,486 |
| 2002 | 45,367 | 6,500 | 336,820 | 39,778 | 6,655 | 4,660 | 1,300 | 4,035 | 0 | 3,810 | 0 | 0 | 448,925 |
| 2003 | 9,350 | 900 | 65,020 | 7,890 | 0 | 0 | 2,150 | 0 | 0 | 0 | 0 | 0 | 85,310 |
| 2004 | 18,883 | 1,650 | 97,380 | 23,600 | 5,120 | 0 | 3,400 | 0 | 550 | 1,973 | 0 | 0 | 152,556 |
| 2005 | 96,621 | 5,495 | 319,700 | 15,657 | 14,910 | 78,333 | 1,600 | 331 | 2,390 | 1,338 | 0 | 0 | 536,375 |
| 2006 | 85,269 | 7,277 | 378,123 | 42,931 | 52,382 | 67,171 | 5,030 | 7,876 | 1,410 | 5,237 | 796 | 10,693 | 664,195 |
| 2007 | 215,282 | 12,536 | 241,356 | 98,979 | 242,695 | 39,140 | 9,900 | 67,072 | 9,712 | 77,249 | 35,946 | 8,800 | 1,058,667 |
| 2008 | 142,726 | 31,969 | 204,881 | 71,385 | 134,008 | 84,361 | 2,257 | 137,304 | 11,244 | 98,041 | 56,867 | 0 | 975,043 |
| 2009 | 130,295 | 45,294 | 196,888 | 63,725 | 122,379 | 90,771 | 3,900 | 116,312 | 11,339 | 96,456 | 34,522 | 9,439 | 921,320 |
| 2010 | 68,511 | 47,612 | 191,321 | 64,913 | 0 | 77,550 | 107,037 | 130,533 | 7,919 | 37,021 | 19,524 | 963 | 752,904 |
| 2011 | 107,610 | 57,670 | 401,034 | 138,540 | 0 | 84,857 | 84,727 | 227,873 | 17,435 | 47,058 | 31,949 | 4,155 | 1,202,908 |
| 2012 | 221,255 | 24,450 | 507,305 | 129,666 | 110,800 | 57,015 | 93,296 | 136,679 | 12,520 | 96,916 | 26,070 | 6,436 | 1,422,408 |
| 2013 | 164,345 | 8,600 | 256,546 | 102,197 | 40,050 | 28,146 | 138,841 | 73,101 | 10,234 | 187,848 | 32,954 | 0 | 1,042,862 |
| 2014 | 136,743 | 7,556 | 353,979 | 117,835 | 31,800 | 34,054 | 70,180 | 81,734 | 1,500 | 172,126 | 42,646 | 0 | 1,050,153 |
| 2015 | 100,135 | 26,396 | 227,946 | 144,500 | 50 | 88,791 | 76,203 | 128,510 | 332 | 179,246 | 53,245 | 267 | 1,025,621 |
| 2016 | 73,119 | 29,493 | 187,838 | 155,315 | 0 | 86,818 | 69,213 | 17,282 | 705 | 166,613 | 35,708 | 0 | 822,104 |
| 2017 | 21,547 | 16,820 | 46,707 | 81,639 | 40,200 | 28,082 | 25,281 | 9,777 | 120 | 63,270 | 14,672 | 0 | 348,115 |
| 2018 | 11,182 | 4,645 | 34,721 | 51,828 | 118,000 | 11,428 | 11,335 | 4,549 | 149 | 50,444 | 4,747 | 4,100 | 307,128 |
| 2019* | 24,787 | 14,713 | 37,876 | 102,491 | 6,427 | 44,273 | 13,288 | 13,909 | 1,990 | 40,393 | 26,064 | 1,683 | 328,194 |
| 2020 | 4,220 | 1,190 | 8,356 | 23,183 | 0 | 5,250 | 13,152 | 1,397 | 0 | 24,462 | 38,074 | 0 | 119,284 |
| 2021* | 15,279 | 7,850 | 32,100 | 37,392 | 0 | 30,034 | 13,109 | 4,685 | 0 | 22,386 | 8,475 | 0 | 171,618 |
| Grand Total | 2,018,973 | 405,971 | 11,572,573 | 1,794,466 | 3,892,370 | 983,724 | 1,160,560 | 1,302,208 | 104,464 | 1,419,126 | 462,390 | 46,536 | 25,163,969 |

*Grand total includes 300 lbs of Bowfin (2019) and 308 lbs of Bowfin (2021).

Table 3. Mean catch per 24-hour soak time for species during spring trap net surveys in Anchor Bay, Lake St. Clair, 2002-2021.

| Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BLACK CRAPPIE | 0 | 0.007 | 0.115 | 0 | 0 | 0 | 0 | 0.015 | 0.009 | 0.055 | 0.075 | 0.041 | 0.008 | 0 | | 0 | 0 | 0.012 | | 0 | 0.02 |
| BLUEGILL | 0.057 | 0 | 0.053 | 0.01 | 0.024 | 0 | 0.053 | 0 | 0.009 | 0.229 | 0.031 | 0.066 | 0.008 | 0.037 | | 0.024 | 0 | 0 | | 0.019 | 0.03 |
| BROWN BULLHEAD | 0.024 | 0.01 | 0.015 | 0 | 0.008 | 0.01 | 0 | 0.023 | 0.026 | 0.016 | 0 | 0.075 | 0.008 | 0 | N | 0.027 | 0.096 | 0.024 | N | 0 | 0.02 |
| CHANNEL CATFISH | 1.88 | 1.848 | 1.704 | 1.205 | 1.759 | 2.011 | 3.143 | 2.224 | 2.244 | 1.22 | 2.635 | 2.532 | 3.916 | 1.611 | o | 2.052 | 1.014 | 5.077 | o | 5.091 | 2.40 |
| COMMON CARP | 0 | 0 | 0.009 | 0.01 | 0.032 | 0 | 0 | 0.431 | 0.317 | 0.046 | 0.083 | 0.145 | 0.147 | 0.121 | | 0.203 | 0.097 | 0.156 | | 0 | 0.10 |
| WHITE SUCKER | 0.135 | 0.081 | 0.12 | 0.101 | 0.103 | 0.331 | 0.146 | 0.062 | 0.161 | 0.218 | 0.025 | 0.158 | 0.314 | 0.123 | | 0.072 | 0.162 | 0.102 | | 0.057 | 0.14 |
| FRESHWATER DRUM | 1.301 | 4.013 | 1.683 | 0.361 | 2.265 | 0.474 | 0.356 | 0.593 | 0.655 | 0.516 | 0.349 | 0.38 | 0.249 | 0.21 | S | 0.443 | 0.321 | 0.264 | S | 0.552 | 0.83 |
| GIZZARD SHAD | 0.04 | 0.034 | 0.006 | 0.03 | 0.012 | 0.007 | 0 | 0 | 0 | 0.006 | 0.152 | 0.099 | 0.012 | 0.028 | u | 0.32 | 0.051 | 0.012 | u | 0.11 | 0.05 |
| GOLDEN REDHORSE | 0.005 | 0.013 | 0.019 | 0.021 | 0.024 | 0.01 | 0 | 0.054 | 0 | 0.009 | 0 | 0.049 | 0.015 | 0.042 | r | 0 | 0 | 0 | r | 0 | 0.01 |
| LAKE STURGEON | 0.011 | 0.055 | 0.034 | 0.015 | 0.05 | 0 | 0.098 | 0.046 | 0.013 | 0.089 | 0.013 | 0.046 | 0.017 | 0.078 | v | 0.033 | 0.028 | 0 | v | 0 | 0.03 |
| LARGEMOUTH BASS | 0.224 | 0.037 | 0.111 | 0.025 | 0.033 | 0.099 | 0.101 | 0.108 | 0.057 | 0.212 | 0.03 | 0.18 | 0.1 | 0.104 | e | 0.043 | 0.077 | 0.096 | e | 0.013 | 0.09 |
| MUSKELLUNGE | 0.281 | 0.262 | 0.626 | 0.707 | 0.478 | 0.492 | 0.129 | 0.825 | 0.18 | 0.098 | 0 | 0.116 | 0.075 | 0.066 | y | 0.026 | 0.006 | 0.024 | y | 0 | 0.24 |
| NORTHERN PIKE | 0.895 | 0.146 | 0.575 | 0.87 | 0.864 | 0.655 | 0.547 | 0.705 | 1.023 | 1.106 | 0.697 | 1.544 | 1.673 | 1.512 | | 1.3 | 1.252 | 1.152 | | 0.634 | 0.95 |
| PUMPKINSEED | 3.024 | 0.546 | 0.495 | 0.025 | 0.224 | 0.455 | 0.708 | 0.399 | 0.736 | 1.543 | 0.838 | 0.767 | 0.458 | 0.193 | | 1.573 | 0.156 | 0.138 | | 0.047 | 0.68 |
| QUILLBACK | 0.221 | 0.132 | 0.262 | 0.07 | 0.277 | 0.063 | 0.268 | 0.34 | 0.323 | 0.248 | 0.056 | 0.152 | 0.233 | 0.023 | | 0.149 | 0.026 | 0.093 | | 0.037 | 0.17 |
| ROCK BASS | 30.343 | 13.952 | 14.647 | 6.163 | 15.441 | 21.732 | 22.117 | 29.086 | 53.814 | 23.253 | 36.346 | 19.326 | 8.97 | 15.494 | | 27.587 | 14.452 | 4.475 | | 6.859 | 20.23 |
| SHORTHEAD REDHORSE | 1.137 | 1.898 | 0.69 | 0.773 | 1.622 | 0.514 | 0.997 | 0.76 | 1.155 | 1.295 | 0.735 | 0.519 | 0.367 | 0.408 | | 0.586 | 0.539 | 0.305 | | 0.24 | 0.81 |
| SILVER REDHORSE | 0.254 | 0.266 | 0.54 | 0.591 | 0.95 | 0.302 | 0.952 | 1.365 | 1.542 | 1.288 | 0.264 | 0.87 | 0.656 | 0.443 | | 1.112 | 0.448 | 0.423 | | 0.227 | 0.69 |
| SMALLMOUTH BASS | 4.32 | 8.162 | 2.373 | 1.732 | 3.834 | 5.842 | 2.743 | 3.499 | 8.487 | 6.921 | 4.005 | 3.683 | 3.471 | 2.289 | | 2.605 | 2.89 | 3.823 | | 1.321 | 4.00 |
| TIGER MUSKIE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.025 | 0 | 0.011 | 0.006 | 0 | | 0.024 | 0.031 | 0.006 | | 0.009 | 0.01 |
| WALLEYE | 2.166 | 1.552 | 1.148 | 2.428 | 2.403 | 1.72 | 1.254 | 1.978 | 1.029 | 2.135 | 1.017 | 1.908 | 1.514 | 1.315 | | 7.18 | 5.513 | 2.978 | | 4.594 | 2.44 |
| WHITE BASS | 0.031 | 0.052 | 0.031 | 0 | 0.071 | 0.047 | 0.271 | 0.423 | 0.154 | 0.261 | 1.56 | 0.374 | 0.474 | 0 | | 0.333 | 0.112 | 0.024 | | 0.009 | 0.23 |
| WHITE PERCH | 0.112 | 0.045 | 0.352 | 0.049 | 1.112 | 0.102 | 0.956 | 0.444 | 0.785 | 0.826 | 0.668 | 0.845 | 0.122 | 0.075 | | 0.197 | 0.438 | 0.502 | | 0.104 | 0.43 |
| YELLOW PERCH | 3.128 | 0.739 | 2.148 | 0.505 | 0.582 | 2.218 | 2.498 | 0.498 | 0.393 | 1.31 | 1.19 | 0.963 | 0.856 | 1.432 | | 3.202 | 3.619 | 0.878 | | 2.007 | 1.56 |
| Number of net lifts | 64 | 50 | 55 | 34 | 42 | 50 | 35 | 22 | 54 | 54 | 39 | 46 | 40 | 36 | | 36 | 36 | 28 | | 28 | |
| Starting date | 03-May | 28-May | 03-May | 11-May | 05-May | 03-May | 06-May | 08-May | 03-May | 25-Apr | 25-Apr | 22-Apr | 24-Apr | 27-Apr | | 24-Apr | 23-Apr | 22-Apr | | 26-Apr | |
| Ending date | 30-May | 20-Jun | 26-May | 25-May | 24-May | 22-May | 20-May | 20-May | 24-May | 25-May | 14-May | 20-May | 19-May | 18-May | | 18-May | 14-May | 15-May | | 12-May | |
| Starting water temp. ($^0$C) | 9 | 12 | 8 | 9 | 13 | 9 | 13 | 12 | 14 | 9 | 9 | 8 | 8 | 8 | | 11 | 7 | 6.9 | | 7.3 | |
| Ending water temp. ($^0$C) | 15 | 16 | 15 | 13 | 13 | 13 | 11 | 14 | 17 | 13 | 14 | 15 | 13 | 14 | | 13 | 12 | 9.4 | | 9.2 | |
| Average secchi depth (m) | 1.8 | 2.2 | 1.2 | 2.2 | 1.7 | 2.6 | 2.1 | 1.5 | 1.7 | 1.3 | 1.9 | 1.93 | 2.1 | 3 | | 1.86 | 2.37 | 2.2* | | 2.8* | |

*Since 2019 secchi depth has been estimated through its relationship with water turbidity measurements.

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